US Army Corps
of Engineers
Waterways Experiment
Station

(2)

March 1993

Repair, Evaluation, Maintenance, and Rehabilitation Research Program

Index of REMR Technology and Listing of REMR Research Publications Through March 1993

by William F. McCleese, Nancy F. Curtis
Structures Laboratory

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Prepared for Headquarters, U.S. Army Corps of Engineers

The following two letters used as part of the number designating technical reports of research published under the Repair, Evaluation, Maintenance, and Rehabilitation (REMR) Research Program identify the problem area under which the report was prepared:

	Problem Area		Problem Area
CS	Concrete and Steel Structures	EM	Electrical and Mechanical
GT	Geotechnical	EI	Environmental Impacts
HY	Hydraulics	OM	Operations Management
CO	Coastal		

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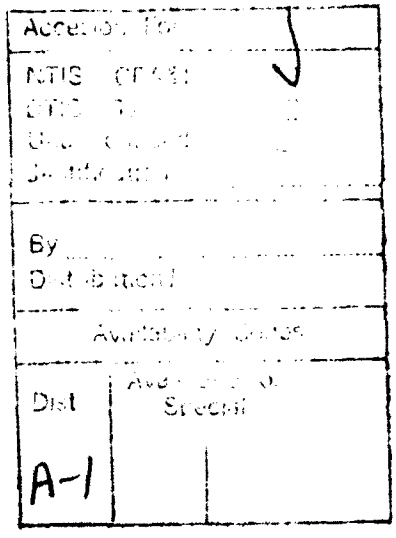

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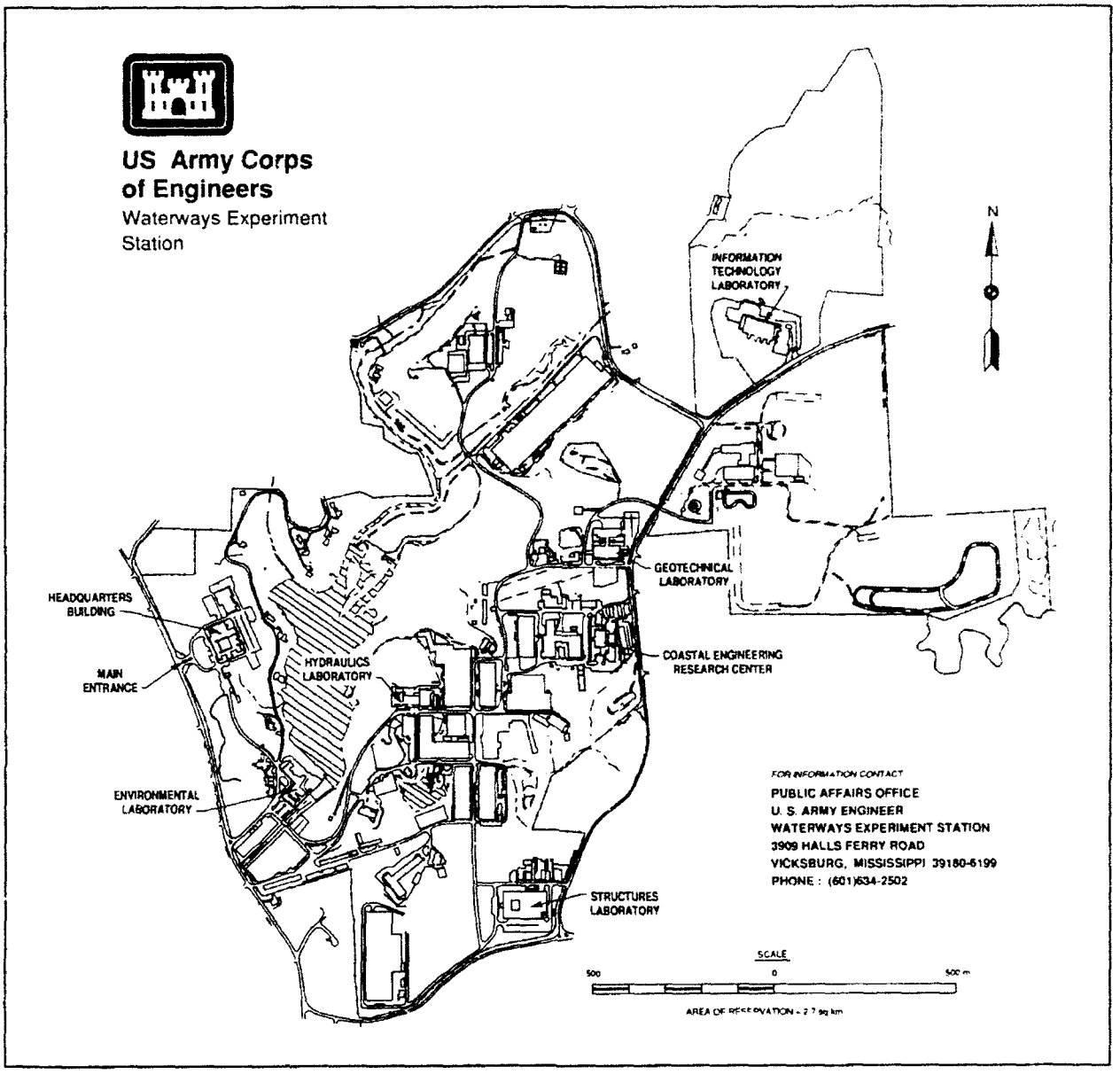
Prepared for U.S. Army Corps of Engineers
Washington, DC 20314-1000



Waterways Experiment Station Cataloging-in-Publication Data

McCleese, William F.
Index of REMR technology and listing of REMR research publications through March 1993 / by William F. McCleese, Nancy F. Curtis ; prepared for U.S. Army Corps of Engineers.
iv, 56 p. : ill. ; 28 cm.
1. Repair, Evaluation, Maintenance, and Rehabilitation Research Program — Indexes. 2. Concrete construction — Maintenance and repair — Indexes. 3. Hydraulic structures — Maintenance and repair — Indexes. I. Curtis, Nancy F. II. United States. Army. Corps of Engineers. III. U.S. Army Engineer Waterways Experiment Station. IV. Repair, Evaluation, Maintenance and Rehabilitation Research Program. IV. Title.
TA681 R45i 1993

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Preface

This index was authorized by Headquarters, U.S. Army Corps of Engineers (HQUSACE), as part of the Program Management of the Repair, Evaluation, Maintenance, and Rehabilitation (REMR) Research Program. Mr. William F. McCleese, Structures Laboratory (SL), U.S. Army Engineer Waterways Experiment Station (WES), was the REMR Program Manager. The REMR Coordinator for the Directorate of Research and Development was Mr. William N. Rushing. Members of the REMR Overview Committee were Mr. James E. Crews and Dr. Tony C. Liu.

This index lists information sources useful to anyone engaged in repair, evaluation, maintenance, and rehabilitation activities in the following areas: coastal, concrete and steel structures, electrical and mechanical, environmental impacts, geotechnical, hydraulics, and operations management.

The work is divided into five chapters. Chapter 1 is a subject index that references technology addressed in REMR publications. Chapters 2 through 5 are lists of the titles of these publications: technical reports, technical notes and material data sheets from *The REMR Notebook*, articles from *The REMR Bulletin*, and videos. Entries are current through March 1993 and will be updated periodically.

This index was compiled by Mr. McCleese and Ms. Nancy F. Curtis, REMR Research Program, under the general supervision of Messrs. Kenneth L. Saucier, Chief, Concrete Technology Division, SL; James T. Ballard, Assistant Director, SL; and Bryant Mather, Director, SL.

At the time of the publication of this report, Dr. Robert W. Whalin was Director of WES. COL Leonard G. Hassell, EN, was Commander.

1 Subject Index of REMR Documents

All REMR technology - as published in technical reports, technical notes and material data sheets from *The REMR Notebook*, and articles from *The REMR Bulletin* through March 1993 - is indexed by subject. The first entry listed is a problem area of the REMR Research Program. The problem areas are as follows:

- **Coastal Applications**
- **Concrete and Steel Structures**
- **Electrical and Mechanical Applications**
- **Environmental Impacts**
- **Geotechnical Applications**
- **Hydraulics Applications**
- **Operations Management**

Additional subject categories are listed under each problem area to assist the reader in the rapid identification of REMR publications. The codes (letters and numbers) of the publications containing information on a subject are explained below. Chapters 2, 3, and 4 provide information that will aid in locating the publication (full title, author(s), date, ADA number, etc.). The basic codes are as follows:

- **Technical reports - TR followed by the problem area abbreviation and report number.**
- ***The REMR Bulletin* - RB followed by the volume and number of issue.**
- ***The REMR Notebook* - CM (concrete materials), CO (Coastal), CS (Concrete and Steel), EI (Environmental Impacts), EM (Electrical and Mechanical), GT (Geotechnical), HY (Hydraulics), and OM (Operations Management) followed by additional codes.**

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REMR-EM-2	Sep 87	Evaluation of Bird Pest Problems at U.S. Army Corps of Engineers Civil Works Projects, by Anthony J. Krzysik	AD A191 173
REMR-EM-3	Oct 88	Underwater Applied Coatings: A State-of-the-Art Investigation, by R. W. Drisko and J. R. Yanez	AD A201 712
REMR-EM-4	Sep 89	Hydroelectric Generator and Generator-Motor Insulation Tests, by Robert H. Bruck and Ray G. McCormack	AD A212 924
REMR-EM-5	Aug 89	Lubricants for Hydraulic Structures, by Ward B. Clifton and Alfred D. Beitelman	AD A213 260
REMR-EM-6	Dec 89	Mechanical Properties and Corrosion Behavior of Stainless Steels for Locks, Dams, and Hydroelectric Plant Applications, by Ashok Kumar, Ali A. Odeh, and J.R. Myers	AD A219 490
REMR-EM-7	Jan 92	High-Solids and 100-Percent Solids Coatings: A State-of-the-Art Investigation, by John Baker and Alfred D. Beitelman	AD A247 557
Unnumbered	Jun 89	Proceedings of REMR Workshop on Management of Bird Pests, by Anthony J. Krzysik	AD A210 086

Environmental Impacts

REMR-EI-1	Nov 86	Applicability of Environmental Laws to REMR Activities, by Jim E. Henderson and Linda D. Peyman	AD A177 322
REMR-EI-2	Nov 86	Bibliography of Environmental Research Related to REMR, by Nelson R. Nunnally	AD A177 069
REMR-EI-3	Aug 88	Compliance Requirements for Environmental Laws Applicable to REMR Activities, by Jim E. Henderson and Linda D. Peyman-Dove	AD A200 193
REMR-EI-4	Aug 88	Seasonal Regulation of Repair, Evaluation, Maintenance, and Rehabilitation (REMR) Activities, by Mark W. LaSalle, John Nestler, and Andrew C. Miller	AD A198 016

REMR-EI-5	Aug 91	The Effects of Vegetation on the Structural Integrity of Sandy Levees, by Donald H. Gray, Anne MacDonald, Thomas Thomann, Imogene Blatz, and F. Douglas Shields, Jr.	AD A240 267

Geotechnical Applications

REMR-GT-1	Sep 84	Mathematical Analyses of Landside Seepage Berms, by Reginald A. Barron	AD A150 014
REMR-GT-2	Aug 85	Improvement of Liquefiable Foundation Conditions Beneath Existing Structures, by Richard H. Ledbetter	AD A160 695
REMR-GT-3		Geotechnical Aspects of Rock Erosion in Emergency Spillway Channels	
	Aug 86	Report 1: by Christopher P. Cameron, Kerry D. Cato, Colin C. McAneny, and James H. May	AD A173 163
	Sep 88	Report 2: Analysis of Field and Laboratory Data, by Christopher P. Cameron, David M. Patrick, Kerry D. Cato, and James H. May	AD A203 774
	Sep 88	Report 3: Remediation, by Christopher P. Cameron, David M. Patrick, Craig O. Bartholomew, Allen W. Hatheway, and James H. May	AD A203 775
	Dec 89	Report 4: Geologic and Hydrodynamic Controls on the Mechanics of Knickpoint Migration, by James H. May	AD A216 749
	Sep 90	Report 5: Summary of Results, Conclusions, and Recommendations, by Christopher P. Cameron, David M. Patrick, James H. May, John B. Palmerton, Colin C. McAnany, Allen W. Hatheway, Craig O. Bartholomew, Christopher C. Mathewson, and Kerry D. Cato	AD A228 781
REMR-GT-4	Nov 87	State of the Art for Design and Construction of Sand Compaction Piles, by Richard D. Barksdale	AD A188 816
REMR-GT-5	Sep 87	Inspection and Control of Levee Underseepage During Flood Fights, by Robert W. Cunny	AD A188 324

REMR-GT-6		Geotechnical Applications of the Self Potential (SP) Method	
	Mar 88	Report 1: The Use of Self Potential in the Detection of Subsurface Flow Patterns in and Around Sinkholes, by Ronald A. Erchul	AD A194 524
	May 89	Report 2: The Use of Self Potential to Detect Ground-water Flow in Karst, by Ronald A. Erchul and Dennis W. Slifer	AD A209 399
	Feb 89	Report 3: Development of Self-Potential Interpretation Techniques for Seepage Detection, by Robert W. Corwin and Dwain K. Butler	AD A207 704
	Mar 90	Report 4: Numerical Modeling of SP Anomalies: Documentation of Program SPPC and Applications, by Michael J. Wilt and Dwain K. Butler	AD A220 716
REMR-GT-7	Dec 87	Applications of the State of the Art of Stone Columns--Liquefaction, Local Bearing Failure, and Example Calculations, by Richard D. Barksdale	AD A191 606
REMR-GT-8	Jul 88	Review of Consolidation Grouting of Rock Masses and Methods for Evaluation, by R. Morgan Dickinson	AD A198 209
REMR-GT-9	Mar 88	A Survey of Engineering Geophysics Capability and Practice in the Corps of Engineers, by Dwain K. Butler, Ronald E. Wahl, Nolan W. R. Mitchell, and Gregory L. Hempen	AD A194 520
REMR-GT-10	Jul 89	High-Resolution Seismic Reflection Investigations at Beaver Dam, Arkansas, by Thomas L. Dobecki, Tanya L. Mueller, and Monroe B. Savage	AD A211 228
REMR-GT-11	Sep 89	Levee Underseepage Analysis for Special Foundation Conditions, by Thomas F. Wolff	AD A213 500
REMR-GT-12	Sep 89	Re-Evaluation of the Sliding Stability of Concrete Structures on Rock with Emphasis on European Experience, by K. Kovari and P. Fritz	AD A214 403
REMR-GT-13	Sep 89	Levee Underseepage Software User Manual and Validation, by Robert W. Cunny, Victor M. Agostinelli, Jr., and Hugh M. Taylor, Jr.	AD A214 024

REMR-GT-14	Mar 90	Surface Roughness Characterization of Rock Masses Using the Fractal Dimension and the Variogram, by James R. Carr	AD A225 384
REMR-GT-15	Mar 91	Plastic Concrete Cutoff Walls for Earth Dams, by Thomas W. Kahl, Joseph L. Kauschinger, and Edward B. Perry	AD A234 566
REMR-GT-16		Redevelopment of Relief Wells, Upper Wood River Drainage and Levee District, Madison County, Illinois, by J. Kissane and Roy E. Leach	
REMR-GT-17	Jan 92	Applications and Testing of Resin-Grouted Rockbolts, by Timothy S. Avery and James E. Friant	AD A245 980
REMR-GT-18	Sep 92	Evaluation of the Rehabilitation Program for Relief Wells at Leesville Dam, Ohio, by Roy E. Leach and Glen Hackett	AD A259 197
REMR-GT-19	Nov 92	DAMSEAL--An Expert System for Evaluating Dam Seepage, by Roger L. King and Wendell O. Miller	
Unnumbered	Jan 88	Proceedings of REMR Workshop on New Remedial Seepage Control Methods for Embankment-Dams and Soil Foundations, by Edward B. Perry	AD A191 073
Unnumbered	Jul 89	Proceedings of REMR Workshop on Research Priorities for Drainage System and Relief Well Problems, by Roy E. Leach and Hugh M. Taylor, Jr.	AD A212 067

Hydraulics Applications

REMR-HY-1	Jul 86	Annotated Bibliography for Navigation Training Structures, Compiled by Walter E. Pankow and Robert F. Athow, Jr.	AD A173 303
REMR-HY-2	Jun 87	Floating Debris Control; A Literature Review, by Roscoe E. Perham	AD A184 033
REMR-HY-3	Sep 88	Elements of Floating Debris Control Systems, by Roscoe E. Perham	AD A200 454
REMR-HY-4	Mar 89	Effects of Geometry on the Kinetic Energy of a Towboat and Barges in a Navigation Lock, by Sandra K. Martin	AD A207 057

REMR-HY-5	Mar 89	Explicit Numerical Algorithm for Modeling Incompressible Approach Flow, by Robert S. Bernard	AD A207 176
REMR-HY-6	Oct 89	Inventory of River Training Structures in Shallow-Draft Waterways, by David L. Derrick, Herbert W. Gernand, and James P. Crutchfield	AD A214 566
REMR-HY-7	Sep 92	Lock Accident Study, by Sandra K. Martin and Martin E. Lipinski	AD A228 627
REMR-HY-8	Apr 91	Shallow-Draft Training Structure Current Repair Practices and Repair Guidelines, by David L. Derrick	AD A239 045
Unnumbered	Apr 91	Proceedings of REMR Workshop on Repair and Maintenance of Shallow-Draft Training Structures, compiled by David L. Derrick	AD A235 666

Operations Management

REMR-OM-1	May 86	Evaluation of Existing Condition Rating Procedures for Civil Works Structures and Facilities, by Enno Koehn and Anthony M. Kao	AD A170 391
REMR-OM-2	Sep 88	REMR Managment System, by H. Thomas Yu and Anthony M. Kao	AD A200 728
REMR-OM-3	Jun 89	User's Manual: Inspection and Rating of Steel Sheet Pile Structures, by Lowell Greimann and James Stecker	AD A210 411
REMR-OM-4	May 89	A Rating System for the Concrete in Navigation Lock Monoliths, by Rupert E. Bullock	AD A208 304
REMR-OM-5	Sep 89	Timber Dike Management System, by H. Thomas Yu and Anthony M. Kao	AD A213 851
REMR-OM-6	Dec 89	Network Level REMR Management System for Civil Work Structures: Concept Demonstration on Inland Waterways Locks, by Michael J. Markow, Sue McNeil, Dharma Acharya, and Mark Brown	AD A217 031
REMR-OM-7	Aug 90	Inspection and Rating of Miter Lock Gates, by Lowell Greimann, James Stecker, and Kevin Rens	AD A227 198

REMR-OM-8	Dec 90	REMR Management Systems-Navigation Structures: Management System for Miter Gates, by Lowell Greimann, James Stecker, and Kevin Rens	AD A231 469
REMR-OM-9	Dec 90	Maintenance and Repair of Steel Sheet Pile Structures, by Lowell Greimann and James Stecker	AD A231 916
REMR-OM-10	Sep 90	Lockwall: A Microcomputer-Based Maintenance and Repair Management System for Concrete Navigation Lock Monoliths, by David T. McKay and Anthony M. Kao	AD A228 625
REMR-OM-11	May 91	REMR Management Systems--Coastal/Shore Protection Structures: Condition Rating Procedures for Rubble Breakwaters and Jetties-Initial Report, by Donald E. Plotkin, D. D. Davidson, and Joan Pope	AD A237 042
REMR-OM-12	Mar 92	REMR Management Systems--Navigation Structures: Users Manual for Concrete Navigation Lock Monoliths, by Automation Support Center, University of Illinois, and David T. McKay	AD A248 994

3 REMR Technical Notes

REMR Technical Notes (TNs) are fact sheets on techniques, materials, and equipment used in REMR research. This section lists all the TNs published in *The REMR Notebook* through March 1993. The first two letters of a TN number correspond to the code for the section of the notebook that contains the technical note.

- **CM -- Concrete Materials**
- **CO -- Coastal Applications**
- **CS -- Concrete and Steel Structures**
- **EI -- Environmental Impacts**
- **EM -- Electrical and Mechanical Applications**
- **GT -- Geotechnical Applications**
- **HY -- Hydraulics Applications**
- **OM -- Operations Management**

The REMR Notebook is intended as a quick reference document. It is a collection of fact sheets that address REMR activities at U.S. Army Corps of Engineers Civil Works projects. Each TN lists a statement of purpose and a point of contact for additional information. It may also include when and where to apply the technology described, advantages and limitations of its use, cost and availability of products or services, and personnel requirements. A copy of the notebook has been distributed to the Engineering Construction, Operations, and Planning Division of each Corps District and Division as well as to the libraries of each District and Division. Technology is made current through yearly supplements.

REMR Technical Notes

Coastal Applications

CO-BS-1.1	Two-Person Rapid Beach Survey Method
CO-RA-1.1	Condition Survey of Concrete Armor Unit Breakage on Existing Corps of Engineers' Breakwaters and Jetties
CO-RR-1.1	Dolos Repair and Rehabilitation
CO-RR-1.2	Fracturing of Rubble Stone by Explosive Charges
CO-RR-1.3	Reduction of Wave Runup on a Revetment by Addition of a Berm
CO-RR-1.4	Performance of Bermed Revetments
CO-RR-1.5	Reduction of Wave Overtopping by Parapets
CO-RR-8.1	Case History of Breakwater/Jetty Repair: Chemical Grout Sealing of Palm Beach Harbor South Jetty, Florida
CO-SE-1.1	Diver Inspection of Coastal Structures
CO-SE-1.2	Crane Survey of Submerged Rubble-Mound Coastal Structures
CO-SE-1.3	High-Resolution Sonar Systems for Bathymetric Applications
CO-SE-1.4	Side Scan Sonar for Inspection of Coastal Structures

Concrete and Steel Structures

CS-ES-1.1	System for Rapid Assessment of Quality of Concrete in Existing Structures
CS-ES-1.2	Sonic Pulse-Echo System for Determining Length and Condition of Concrete Piles In Situ
CS-ES-1.3	Ultrasonic System for Rapid Assessment of Soundness of Sheet Pile and Flat Structures
CS-ES-1.4	Nondestructive Testing Methods for Metal Structures

CS-ES-1.5	Specifying Welding or Nondestructive Testing of Welds
CS-ES-1.6	Underwater Nondestructive Testing of Metal Structures (Training for Divers)
CS-ES-1.7	Petrographic Examination of Distressed Concrete
CS-ES-1.8	Water Absorption and Water Vapor Transmission Testing
CS-ES-1.9	Systems for Detecting Steel Embedded in Concrete
CS-ES-1.10	Nondestructive Testing of Concrete with Ultrasonic Pulse-Echo
CS-ES-2.1	Automated System for Monitoring Plumblines in Dams
CS-ES-2.2	Method of Measuring the Tilt of Large Structures
CS-ES-2.3	Methods of Automating the Collection of Instrumentation Data
CS-ES-2.4	Estimation of Reliability for Civil Works Steel Structures
CS-ES-2.5	Economically Optimal Nondestructive Evaluation of Steel Structures
CS-ES-2.6	Video Systems for Underwater Inspection of Structures
CS-ES-2.7	Continuous Monitoring of Small Structural Deformations
CS-ES-3.1	System for Rapid, Accurate Surveys of Submerged Horizontal Surfaces
CS-ES-3.2	Underwater Camera for Inspection of Structures in Turbid Water
CS-ES-3.3	Underwater Cleaning of Concrete and Steel: Powered Hand Tools
CS-ES-3.4	Underwater Cleaning of Concrete and Steel: Abrasive Waterjets
CS-ES-3.5	Underwater Cleaning of Concrete and Steel: High-Pressure Waterjets
CS-ES-3.6	Underwater Cleaning of Concrete and Steel: Diver-Operated Jet-Dredge
CS-ES-3.7	Underwater Cleaning of Concrete and Steel: Self-Propelled Vehicles

CS-ES-4.1	Using Current Guidance to Conduct a Stability Analysis of a Concrete Structure Founded on Rock or Soil
CS-ES-4.2	Computer Programs for Structural Stability Evaluations
CS-MG-1.1	Grouting Systems for Concrete Anchors
CS-MG-1.2	Diver Operated Grout Dispenser
CS-MR-1.1	Concrete Removal Technique: Cutter Boom
CS-MR-1.2	Concrete Removal Technique: Explosive Blasting
CS-MR-1.3	Concrete Removal Technique: Expansive Agent
CS-MR-1.4	Concrete Removal Technique: Vehicle-Mounted Breaker
CS-MR-1.5	Concrete Removal Technique: Hand-Held Breaker
CS-MR-1.6	Concrete Removal Technique: Diamond Blade Saw
CS-MR-1.7	Concrete Removal Technique: Stitch Drilling
CS-MR-1.8	Concrete Removal Technique: Concrete Splitter
CS-MR-1.9	Concrete Removal Technique: Water Jet Blasting
CS-MR-1.10	Concrete Removal Technique: Shot Blasting
CS-MR-1.11	Concrete Removal Technique: Diamond Wire Cutting
CS-MR-1.12	Removal Limits for Repair of Damaged and Deteriorated Concrete Structures
CS-MR-1.13	Lock Wall Rehabilitation
CS-MR-2.1	Concrete Surface Preparation Prior to Repair
CS-MR-3.1	Selection of a Crack Repair Method
CS-MR-3.2	Crack Repair Method: Routing and Sealing
CS-MR-3.3	Crack Repair Method: Drilling and Plugging
CS-MR-3.4	Crack Repair Method: External Stressing

CS-MR.3.5	Crack Repair Method: Stitching
CS-MR-3.6	Crack Repair Method: Conventional Reinforcement
CS-MR-3.7	Crack Repair Method: Grouting (Portland-Cement & Chemical)
CS-MR-3.8	Crack Repair Method: Drypacking
CS-MR-3.9	Crack Repair Method: Epoxy Injection
CS-MR-3.10	Crack Repair Method: Flexible Sealing or Mastic Filling
CS-MR-3.11	Crack Repair Method: Polymer Impregnation
CS-MR-3.12	Hydrostatic Tests of Injection Ports Used for In Situ Repair of Concrete
CS-MR-4.1	Applying Colorless Coatings to Brick Masonry
CS-MR-4.2	Graffiti-Resistant Coatings
CS-MR-4.3	Removal and Prevention of Efflorescence on Concrete and Masonry Building Surfaces
CS-MR-4.4	Cleaning Concrete Surfaces
CS-MR-7.1	General Information on Polymer Materials
CS-MR-7.2	Antiwashout Admixtures for Underwater Concrete
CS-MR-7.3	Rapid-Hardening Cements and Patching Material
CS-MR-8.1	Case History of Underwater Concrete Repair: Repair of Stilling Basin, Webbers Falls Lock and Dam, Arkansas River, Using Tremie Concrete
CS-MR-8.2	Case History of Lock Rehabilitation: Brandon Road Lock, Illinois Waterway
CS-MR-8.3	Case History of Improving Structural Stability of Concrete Structures on Rock: Grouting, Crack Repair, and Installation of Rock Anchors at John Day Lock and Dam
CS-MR-8.4	Case History of Improving Structural Stability of Concrete Structures on Rock: Installation of Rock Anchors to Improve Stability Against Sliding, Alum Creek Dam

CS-MR-8.5 Case History of Improving Structural Stability of Concrete Structures on Rock: Installation of Rock Anchors to Improve Stability Against Overturning, Lock No. 3, Monongahela River

CS-MR-8.6 Case History of Lock Rehabilitation: Lockport Lock, Illinois Waterway

CS-MR-8.7 Case History of Monolith Joint Repairs: Lock No. 2, Mississippi River

CS-MR-8.8 Case History of Dam Repair: Remedial Waterstops

CS-MR-9.1 Specialized Repair Technique: Repair of Structures Damaged by Abrasion-Erosion

CS-MR-9.2 Specialized Repair Technique: Repair of Structures Damaged by Cavitation-Erosion

CS-MR-9.3 Specialized Repair Technique: Concrete Underwater

CS-MR-9.4 Specialized Repair Technique: Preplaced-Aggregate Concrete

Concrete and Steel Structures Material Data Sheets

CM-CR-1.1 Epoxy Resin System for Dormant Crack Repair and Surface Sealer: Sikadur 52

CM-CR-1.2 Epoxy Resin System for Dormant Crack Repair: Deco-Rez 3517

CM-CR-1.3 Epoxy Resin System for Dormant Crack Repair: Brutem 78

CM-CR-1.4 Epoxy Resin System for Dormant Crack Repair: Denepox 40

CM-CR-1.5 Epoxy Resin System for Dormant Crack Repair and Surface Sealer: Delta AS69-9046 Underwater Bonding Adhesive

CM-CR-1.6 Epoxy Resin System for Dormant Crack Repair: Flexolith

CM-CR-1.7 Epoxy Resin System for Dormant Crack Repair: Duralith

CM-LA-1.1 Latex Admixture for Portland-Cement Concrete and Mortar: Polyvinyl NeoCryl A-1055

CM-LA-1.2 Latex Admixture for Portland-Cement Concrete and Mortar: AKKRO 7-T

CM-LA-1.3	Latex Admixture for Portland-Cement Concrete and Mortar: Acryl 60
CM-LA-1.4	Latex Admixture for Portland-Cement Concrete and Mortar: Acryl Set
CM-LA-1.5	Latex Admixture for Portland-Cement Concrete and Mortar: Rhoplex MC-76
CM-LA-1.6	Latex Admixture for Portland-Cement Concrete and Mortar: Polysar Latex 1186
CM-LM-1.1	Latex-Modified Mortar: SikaTop 123 Gel Mortar
CM-MM-1.1	Epoxy Modified Mortar: Sika Armatec 110
CM-OL-1.1	Concrete Overlay: Mark 163 (FlexoGrid)
CM-PC-1.1	Concrete Patching Material: Set 45
CM-PC-1.2	Concrete Patching Material: GILCO Highway Patch
CM-PC-1.3	Concrete Patching Material: Deco-Rez TPM 722
CM-PC-1.4	Concrete Patching Material: Deco-Rez TPM 711
CM-PC-1.5	Concrete Patching Material: SikaSet Roadway Patch
CM-PC-1.6	Concrete Patching Material: Deco-Rez 3577LV
CM-PC-1.7	Concrete Patching Material: Masterflow 713 Grout
CM-PC-1.8	Concrete Patching Material: Five Star Structural Concrete
CM-PC-1.9	Concrete Patching Material: Deco-Rez TPM 721
CM-PC-1.10	Concrete Patching Material: Ceilcote 646 Underwater Grout
CM-PC-1.11	Concrete Patching Material: Speed Crete
CM-PC-1.12	Concrete Patching Material: Ceilcote 665 Epoxy Mortar
CM-PC-1.13	Concrete Patching Material: Burke 881 LPL
CM-PC-1.14	Concrete Patching Material: Celtite 10-60 CELROC RPM
CM-PC-1.15	Concrete Patching Material: Waterplug

CM-PC-1.16 Concrete Patching Material: Epodur 786

CM-PC-1.17 Concrete Patching Material: Gemcrete

CM-PC-1.18 Concrete Patching Material: Resist-A-Chem 5073

CM-PC-1.19 Concrete Patching Material: Wear Resistant Putty WR-2

CM-PC-1.20 Concrete Patching Material: Concresive 1064

CM-PC-1.21 Concrete Patching Material: Rapid Set Cement

CM-PC-1.22 Concrete Patching Material: Five Star Highway Patch

CM-PC-1.23 Concrete Patching Material: PYRAMENT 505

CM-PC-1.24 Concrete Patching Material: Renderoc HB

CM-PC-1.25 Concrete Patching Material: Renderoc SD

CM-PC-1.26 Concrete Patching Material: EMBECO 411-A Mortar

CM-PC-1.27 Concrete Patching Material: Rapid Set Grout

CM-PC-1.28 Concrete Patching Material: RP-6414 Mortar

CM-PC-1.29 Concrete Patching Material: WearGuard Abrasion-Resistant Compound XMH-8506

CM-PC-1.30 Concrete Patching Material: WearGuard-Fine Abrastion-Resistant Compound XMH-8507

CM-PC-1.31 Concrete Patching Materials: Fondag

CM-PC-1.32 Concrete Patching Materials: Resurf SF Polymer Concrete

CM-PC-1.33 Concrete Patching Materials: Ceramite Castable 100

CM-PC-1.34 Concrete Patching Materials: 88-H-1 Stress Relieved Epoxy Binder

CM-PC-1.35 Concrete Patching Materials: VERSAFILL 60A/60B

CM-PC-1.36 Concrete Patching Materials: Q-8669 Polyester Resin

CM-PC-2.1 Fast Setting Patching Materials: Penatron [illegible]/M-3003

CM-PC-2.2	Fast Setting Patching Materials: Pyrament Blended Cements
CM-PC-2.3	Fast Setting Patching Materials: Regulated-Set Portland Cement
CM-PC-2.4	Fast Setting Patching Materials: BONSAL Rapid Patch
CM-PC-2.5	Fast Setting Patching Materials: Rapid Set Concrete Mix
CM-PC-2.6	Fast Setting Patching Materials: Delcrete Elastomeric Concrete
CM-SE-1.1	Concrete Sealer: PSI 6000
CM-SE-1.2	Concrete Sealer: Consolideck SX
CM-SE-1.3	Concrete Sealer: Preserva-Crete
CM-SE-1.4	Concrete Sealer: Dekguard
CM-SE-1.5	Concrete Stain: Dymacryl
CM-SE-1.6	Concrete Coating: Chemglaze A487
CM-SE-1.7	Concrete Coating: 3M XA-5893
CM-SE-1.8	Concrete Sealer: Terracote
CM-SE-1.9	Concrete Coating: Chemglaze M331
CM-SE-1.10	Concrete Sealer: Rainstopper 100
CM-SE-1.11	Concrete Sealer: Penetrating Epoxy Sealer
CM-SE-1.12	Concrete Sealer: Sinak 101 and Sinak 102
CM-SE-1.13	Concrete Sealer: Sinak P-103 Sealer
CM-SE-1.14	Concrete Sealer: SC Seal Cure
CM-SE-1.15	Concrete Sealer: Thompson's Water Seal
CM-SE-1.16	Concrete Sealer: Bridge 10
CM-SE-1.17	Concrete Sealer: Radcon #7
CM-SE-1.18	Concrete Sealer: Stop Spall

CM-SE-1.19	Concrete Sealer: Crystal Seal
CM-SE-1.20	Concrete Sealer: Dural 330
CM-SE-1.21	Concrete Sealer: Chem-Tret BSM
CM-SE-1.22	Concrete Sealer: Keim Silan Primer
CM-SE-1.23	Concrete Sealer: Pen Seal 50
CM-SE-1.24	Concrete Sealer: Sil-Act ATS 42
CM-SE-1.25	Concrete Sealer: Clear Cladding
CM-SE-1.26	Concrete Sealer: Mark 124
CM-SE-1.27	Concrete Sealer: LCS-8327 and LCS-8175
CM-SE-1.28	Concrete Sealer: Keim Lotexan
CM-SE-1.29	Concrete Sealer: LD-12 Masonry and Concrete Primer/Sealer
CM-SE-1.30	Concrete Sealer: HD-36 Decktreat
CM-SE-1.31	Concrete Sealer: SPECCO W-5 Sealer
CM-SE-1.32	Concrete Sealer: HEY'D1 Siloxan
CM-SE-1.33	Concrete Sealer: Price Seal 15
CM-SE-1.34	Concrete Sealer: TBS-960
CM-SE-1.35	Concrete Sealer: DP4992
CM-SE-1.36	Concrete Sealer: Poly-Mer DP4994
CM-SE-1.37	Concrete Sealer: Acryltex 2500
CM-SE-1.38	Concrete Sealer: Uni-Tile Sealer
CM-SE-1.39	Concrete Sealer: Super-Kote
CM-SE-1.40	Concrete Sealer: Deep Seal
CM-SE-1.41	Concrete Sealer: Monocryl 50

CM-SE-1.42	Concrete Sealer: Bitumastic 300-M
CM-SE-1.43	Concrete Sealer: Thoroglaze H
CM-SE-1.44	Concrete Sealer: Thoroclear Special
CM-SE-1.45	Concrete Sealer: Dow Corning 3-5035
CM-SE-1.46	Concrete Sealer: Price-Seal 7.5
CM-SE-1.47	Concrete Sealer: Neoprene (4100-900)/Hypalon (4200-100) System
CM-SE-1.48	Concrete Sealer: TIAH
CM-SE-1.49	Concrete Sealer: Transpo T41S
CM-SE-1.50	Concrete Sealer: Select Kote-GA-66
CM-SE-1.51	Concrete Sealer: Sikatop 144
CM-SE-1.52	Concrete Sealer: Silikal R41
CM-SE-1.53	Concrete Sealer: PE-50 Penetrating Sealer
CM-SE-1.54	Concrete Sealer: Urethabond 104
CM-SE-1.55	Concrete Sealer: Urethabond 111
CM-SE-1.56	Concrete Sealer: C-15 Pebble Sheen
CM-SE-1.57	Concrete Sealer: Sikagard 70
CM-SE-1.58	Concrete Sealer: Stifel
CM-SE-1.59	Concrete Sealer: Promulsion 60
CM-SE-1.60	Concrete Sealer: Preston CRC 800
CM-SE-1.61	Concrete Sealer: Preston C & S 600
CM-SE-1.62	Concrete Sealer: Thoroclear 777
CM-SE-1.63	Concrete Sealer: Hydrozo Clear 30M
CM-SE-1.64	Concrete Sealer: Elastoid 1300

CM-SE-1.65 Concrete Sealer: Canyon Tone Stain

CM-SE-1.66 Concrete Sealer: Alocit Aquacoat 28.15

CM-WA-1.1 High-Range Water-Reducing Admixture for Concrete: CFR-2

CM-WA-1.2 Water-Reducing, Cement-Dispersing, Set-Control Admixture for Concrete: HPS-R

Electrical and Mechanical Applications

EM-CR-1.1 Selection Guide for Wrought Stainless Steel Fasteners for Civil Works Applications

EM-CR-1.2 Cathodic Protection of Civil Works Structures

EM-CR-1.3 Use of Ceramic Anodes to Prevent Corrosion

EM-CR-1.4 Pipe Corrosion Monitor

EM-CR-1.5 Mechanical Properties and Corrosion Behavior of Stainless Steels for Lock, Dam, and Hydroelectric Plant Applications

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GT-RE-1.2	Methodology for Selecting Shear-Strength Parameters of Rock
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GT-SE-1.1	USDA Soil Conservation Service Spillway Erosion Studies
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GT-SR-1.1	Drilling Machine for Excavation for Concrete Cutoff Walls
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OM-CI-1.1	Rating System for Concrete in a Navigation Lock
OM-CI-1.2	The REMR Condition Index: Condition Assessment for Maintenance Management of Civil Works Facilities
OM-MS-1.1	REMR Management Systems for Civil Works Structures

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OM-MS-1.5	REMR Management Systems for Rubble Breakwaters and Jetties
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4 *THE REMR Bulletin* Articles

This section lists all technical articles published in *The REMR Bulletin* through March 1993. The articles are listed by volume and number of the issue in which they appeared. The title and author(s) of each article are provided. A bulletin article listed in Chapter 1 as RB-2-3 can be found under Vol. 2, No. 3. Back issues may be obtained by contacting the REMR Technology Transfer Specialist at (601) 634-2587.

The REMR Bulletin Articles

Vol 1, No. 1, Jan 1984	"The REMR Research Program"
Vol 1, No. 2, Apr 1984	"Mobile District Hosts Third Field Review Group Meeting"
Vol 1, No. 3, Jul 1984	"Acrylic Latex Concrete Repair," by Rosemarie Braatz
	"Seattle District Testing Novel Approach to Reducing Spillway Leakage at Chief Joseph Dam," by Paul Johnson
Vol 1, No. 4, Oct 1984	"Memphis District Turns Riverward for Levee Rehabilitation,"by Joseph Keithley, Jr., and Paul Miller
	"CAGE Project Can Aid Data Gathering and Analysis for Geotechnical Applications," by Wipawi Vanadit-Ellis
	"Construction of Soil-Cement Columns by Jet-Injection Grouting," by Max Gibbs, Paul Pettit, and Georgio Guatteri
Vol 2, No. 1, Mar 1985	"Mining Tool Adapted to Concrete Removal for Lock Wall Rehabilitation Project," by Warren Parr
	"Corps-BuRec Effort Results in High-Resolution Acoustic Mapping System," by Henry Thornton
Vol 2, No. 2, Jun 1985	"French Drilling Machine Shows Advantages in Excavating for Concrete Cutoff Wall," by Charles Hess
	"Geophysical Methods Applied to Detect and Map Seepage Paths at Clearwater Dam," by Dwain Butler
Vol 2, No. 3, Sep 1985	"New Technique for Waterstop Replacement Used at Pine Flat Dam," by Debra Tanis
	"Performance of Repairs to Stop Leakage in Intake Structures," by James McKenzie and Roy Campbell
Vol 3, No. 1, Apr 1986	"Current Methods for Repairing Scoured Areas Downstream from Stilling Basins," by John Hite, Jr.
	"Research Under Way on Problems with Estuarine and Deep Draft Navigation Channel Training Structures," by Robert Athow, Jr., and Michael Trawle
Vol 3, No. 2, Sep 1986	"Floating Debris Control Systems for Hydroelectric Plant Intakes," by Roscoe Perham

	"Protection of Lock Gates from Vessel Impact," by Sandra McKay
Vol 3, No. 3, Dec 1986	"Results from TVA Testing of Grouting Systems for Concrete Anchors," by James McDonald
	"Precast Panels Speed Rehabilitation of Placer Creek Channel" by Kathy Hacker
Vol 4, No. 1, Jul 1987	"Precast Concrete Stay-In-Place Forming System for Lock Wall Rehabilitation," by James McDonald
	"Remedial Measures to Control Excessive Leakage at Richard B. Russell Dam," by Gary Close and John Hager
Vol 4, No. 2, Oct 1987	"Anti-Washout Admixtures for Use in Underwater Concrete Placement," by Kenneth Saucier and Billy Neeley
	"Use of Fiber-Reinforced Acrylic Polymer Modified Concrete as Repair Material at Lock 2," by Michael Dahlquist
Vol 4, No. 3, Nov 1987	"Nondestructive Testing of Foundation at Lock No. 2, Mississippi River," by Michael Dahlquist
	"Chemical Grout Used to Stop Water Leakage in Control Towers and Conduits," by Rick Lewis and Larry Brockman
	"Chemical and Asphaltic Grouts for Sealing Coastal Structures to Sand Infiltration and Wave Transmission," by David Simpson
Vol 4, No. 4, Dec 1987	"Concrete Rehabilitation at Lock and Dam No. 20, Mississippi River," by Jerry Wickersham
	"Epoxy Repair of Cracked Wooden Roof Trusses," by MAJ Sean Wachutka
	"Stabilized Channel Maintenance and Aquatic Habitat," by Douglas Shields, Jr.
Vol 5, No. 1, Mar 1988	"Spillway Rehabilitation at Grapevine Lake Fort Worth District," by Ronald Turner
	"Ultrasonic Pulse-Echo Measurements of the Concrete Sea Wall at Marina Del Rey Los Angeles County, California," by Henry Thornton and Michel Alexander
	"Environmental Impacts of Stilling Basin Dewaterings," by Marc Zimmerman
Vol 5, No. 2, Jul 1988	"Evaluation of Vinylester Resin for Anchor Embedment in Concrete," by James McDonald

"Floating Debris Boom Evaluation Program Summary," by Rosco Perham

"Comparison of Corps of Engineers' and US Bureau of Reclamation's Methods for Calculating Uplift Pressures," by Carl Pace

Vol 5, No. 3, Sep 1988 "Use of New Well Redevelopment Techniques on Relief Wells in Upper Wood River Drainage and Levee District," by Joseph A. Kissane

"Determination of Relief Well Infestation with the Use of Bacterial Activity Test (BAT) Kit," by Roy Leach

"Jetty Repair Projects: Potential Beneficial Impacts," by Douglas G. Clarke

Vol 6, No. 1, Feb 1989 "Performance of Polyester Resin Grouted Rockbolts Installed Under Wet Conditions," by Tim Avery

"Deposition of Calcium Carbonate in Foundation Drain Holes," by Andrew Schaffer

"Effects of a Stearic-Acid Based Admixture on Water Repellency of Concrete," by Kim Titus

Vol 6, No. 2, May 1989 "In Situ Repair of Deteriorated Concrete," by James E. McDonald

"Rehabilitation of Crow Dam Gate Tower," by Robert V. Todd

Vol 6, No. 3, Jul 1989 "Innovative Products and Procedures Used on Chouteau Island Levee Relocation," by Tamara L. Atchley

"Cutoff Wall Construction to Upgrade Mud Mountain Dam," by K. D. Graybeal

"A Review of 'Flume Investigation of a Composite, Erosion Resistant Material,'" by Jerry Lee Anderson and Robert F Athow

Vol 6, No. 4, Oct 1989 "Rehabilitation of Peoria Lock Using Preplaced-Aggregate Concrete," by George J. Mech

"The Repair of Large Concrete Structures by Epoxy Resin Bonding," by Dr. Donald A. Bruce

"Surface Treatments for Concrete," by Tony B. Husbands and Fred E. Causey

Vol 6, No. 5, Dec 1989 "Diamond Wire Cutting Used on Concrete at Marseilles Dam," by Michael W. Edwards

"Evaluation of Water Jet Blasting for Removal of Concrete from Lock Chamber Faces," by Roy L.. Campbell, Sr.

	"Mechanical Presplitting Technique Used in Removal of Concrete from Chamber Face at Dashields Lock," by Doug Meley
Vol 7, No. 1, Jan 1990	"Culvert Repair at Enid Lake, Mississippi," by Elke Briuer
	"Continuous Deformation Surveillance of Large Structures Possible with New Monitoring System," by Carl A. Lanigan
	"A Practical Application of a Low-Berm Revetment," by Heidi Pfeiffer and John P. Ahrens
Vol 7, No. 3, Sep 1990	"Tainter Gate Hoist Chain Replacement to Improve Operations and Maintenance of Lock and Dam No. 20," by James W. Bartek
	"Anchor Embedment in Hardened Concrete Under Submerged Conditions," by James E. McDonald
	"Use of Plastic Concrete to Construct Cutoff Walls for Earth Dams," by Edward B. Perry
Vol 7, No. 4, Dec 1990	"Nondestructive Testing of Concrete with Ultrasonic Pulse-Echo," by A. Michel Alexander
	"Corps Computer Program Helps Select Concrete and Steel Repair Materials," by Elke Briuer
Vol 8, No. 1, Feb 1991	"Automating Maintenance and Repair - The REMR Management Systems for Civil Works Structures," by Anthony M. Kao
	"Preparation, Application, and Inspection of Coatings for Concrete," by Stephen G. Pinney
Vol 8, No. 2, Apr 1991	"Hammondsport Flume: A Case History in Rehabilitation and Repair," by Russell E. Wege
	"Effective Underwater Joint Sealing at Chief Joseph Dam," by Kenneth B. Sondergard
Vol 8, No. 3, Aug 1991	"Zinc Backing Material Expected to Extend Service Life of Bankhead Miter Gates," by Elke Briuer
	"Coastal Structure Acoustic Raster Scanner (CSARS) System for Underwater Inspection," by Jonathan Lott
	"The Potential for Cracking of Silica-Fume Concrete," by James E. McDonald
Vol 8, No. 4, Dec 1991	"Underwater Repair of Concrete Based on REMR Technical Information," by Bruce Harris, James Palma, and Donald Miller
	"Acoustic Emissions Survey to Map Seepage Patterns Under a Navigation Lock," by James Warriner

"Performance of Microprocessor-Based Reinforcing Steel Detector for Concrete Structures," by A. Michel Alexander and Willie E. McDonald

Vol 9, No. 1, Mar 1992

"REMR Management Systems Training for US Army Corps of Engineers Personnel," by David T. McKay

"Spillway Remediation of Saylorville Lake," by Keith Hass, Glen Hotchkiss, and George Mech

"Epoxy Injection of Pier Stems of Mississippi River Dam No. 20," by George Mech and Jerry Wickersham

Vol 9, No. 2, Jun 1992

"If the Primer Is Orange, It Is Probably Red Lead," by Alfred D. Beitelman

"Chemical Grouting of a Concrete Dam," by W. James Marold, Casey M. Koniarski, and Michael P. Bruen

"The Nation's Aging Coastal Infrastructure," by Joan Pope

Vol 9, No. 3, Sep 1992

"Shoreline Erosion Control on Harvel Lake in Germany," by Hollis H. Allen

"Investigating High-Solids and 100-Percent-Solids Coating," by Alfred D. Beitelman and John S. Baker

"Use of Synthetic Oils for Enclosed Gear Cases," by O.S. Marshall, Jr.

Vol 9, No. 4, Dec 1992

"Flow Model for Evaluation and Maintenance of High-Velocity Channels," by Richard L. Stockstill and R.C. Berger

"Icing Problems at Corps Projects," by F. Donald Haynes, Leonard Zabilansky, and Robert Haehnel

Vol 10, No. 1, Mar 1993

"REMR-Designed Stay-in-Place Concrete Forming System Used for Concrete Repair at Troy Lock and Dam," by William Petronis and Alan Ellinwood

"Microtunneling Tests at Waterways Experiment Station," by Robert D. Bennett, D. T. Iseley, and Perry A. Taylor

"Rehabilitation of Permeable Breakwaters and Jetties by Void Sealing, Port Everglades, Florida, South Jetty," by Lyndell Z. Hales

5 REMR Technology Videos

REMR technology videos are available through the Inter-Library Loan Service. A local librarian can request copies of the videos by calling the U.S. Army Engineer Waterways Experiment Station Library at (601) 634-2355. These tapes may be copied and can be used for private viewing, to support classroom instruction, or during presentations.

REMR Videos

REMR-CS-1 Remedial Waterstop Installation at Pine Flat Dam, Dec 86, 13 min, 1/2-in. (See *The REMR Bulletin*, Vol 2, No. 3)

REMR-CS-2 Precast Concrete Stay-in-Place Forming System for Lock Wall Rehabilitation, Jul 88, 20 min, 1/2- & 3/4-in. (See Technical Report REMR-CS-14)

REMR-CS-3 Antiwashout Admixtures for Use in Underwater Concrete Placement, Mar 89, 15 min 20 sec, 1/2-in. (See Technical Report REMR-CS-19 and Technical Note CS-MR-7.2)

REMR-EM-1 REMR I Summary of Electrical and Mechanical Problem Area,

REMR-GT-1 Computer Monitoring of Foundation Grouting, Jun 86, 10 min, 1/2- & 3/4-in.

REMR-HY-1 Excessive Scour Downstream of High Level Emergency Spillways, Oct 87, 20 min, 1/2- & 3/4-in. (See Technical Note HY-FC-1.1)

REMR-PM-1 Overview of the Repair, Evaluation, Maintenance and Rehabilitation (REMR) Research Program, Apr 85, 17-1/2 min, 3/4-in. (See Technical Report Unnumbered CS83)

Workshop: Underwater Inspection & Repair of Hydraulic Structures, 27-28 Nov 84, 1/2-in. (See also Technical Report REMR-CO-11)

Tape 1: Introduction and REMR Overview, CPT Wylie Bearup, 7 min
Concrete & Steel Problem Area, J.E. McDonald, 7-1/2 min
Underwater Inspection of Coastal Structures, Gary Howell, 47 min

Tape 2: Naval Facilities Specialized Inspection Program, Phil Scola, 51 min

Tape 3: Underwater Survey Techniques of the Naval Explosive Ordinance Disposal Technology Center, John Pennella, 17 min
Inspection Techniques in Turbid Water, Dan McGeehan,18 min
Inspection of Kinzua Dam, Anton Kryza, 25 min

Tape 4: Underwater Survey and Repair (TVA), Dave Hegseth, 23 min
Inspection of R. D. Bailey Dam, Lloyd Schell, 20 min

Tape 5: Underwater Repair and New Survey Techniques, Steve Tatro, 32 min

Tape 6: Wynoochee and Chief Joseph Dams Investigation and Repair, George England and Paul Johnson, 40 min
Repair of Lock and Dam 26, Mel Stegall, 16 min

Tape 7: Weber Falls Stilling Basin Repair, Reggie Kikugawa, 30 min

Tapes 7 & 8: Underwater Repair of Hydraulic Structures, John Baehr, 46 min

Tape 8: FY 85 REMR Research Program Review, REMR Staff, 39-1/2 min

Workshop: New Remedial Seepage Control Methods for Embankment-Dams and Soil Foundations, 21-22 Oct 86, 1/2- and 3/4-in. (See Technical Report Unnumbered GT88)

Tape 1: Introduction, REMR Overview, LTC Jack Stephens, William F. McCleese, Britt Mitchell, Edward B. Perry, Joe Kauschinger, 30 min

Tape 2: Chemical and Micro-Fine Grouting, Reuben Karol, 58 min

Tape 3: Drains, Wally Sherman, 40 min

Tape 4: Upstream Impervious Blanket, Bill Morrison, 44 min

Tape 5: Reinforced Downstream Berms, Mike Duncan, 58 min

Tapes 6 & 6A: Plastic Concrete Cutoff Walls, George Tamaro, 72 min

Tape 7: Jet Grouted Cutoff Wall, Giorgio Guatteri, 60 min

Tape 7A: Dynamic Grouting by High, Giorgio Guatteri, 22 min

Tape 8: Use of Hydrofraise to Construct Concrete Cutoff Walls, Joe Parkington, 61 min

Tapes 9 & 9A: Ground Freezing as a Construction Expediency for Excavating Cutoff Trenches and/or Installation of Drains, John Shuster, 75 min

Tape 10: Panel Discussion, Joe Kauschinger, 60 min

Workshop: Repair and Maintenance of Shallow-Draft Training Structures, 24-25 Feb 87, 3 hr 32 min

REPORT DOCUMENTATION PAGE

Form Approved
OMB No 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	March 1993	Final report

4. TITLE AND SUBTITLE

Index of REMR Technology and Listing of REMR Research Publications Through March 1993

5. FUNDING NUMBERS

6. AUTHOR(S)

William F. McCleese and Nancy F. Curtis

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

U.S. Army Engineer Waterways Experiment Station, Structures Laboratory, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

U.S. Army Corps of Engineers
Washington, DC 20314-1000;

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161

12a. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

This index lists information sources useful to anyone engaged in repair, evaluation, maintenance, and rehabilitation (REMR) activities in the following areas: coastal, concrete and steel structures, electrical and mechanical, environmental impacts, geotechnical, hydraulics, and operations management. The work is divided into five chapters. Chapter 1 is a subject index that references technology addressed in REMR publications. Chapters 2 through 5 are lists of the titles of these publications: technical reports, technical notes and material data sheets from *The REMR Notebook*, articles from *The REMR Bulletin*, and videos. Entries are current through March 1993 and will be updated periodically.

14. SUBJECT TERMS	15. NUMBER OF PAGES
See reverse.	56
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	

14. Subject Terms (Concluded)

Coastal applications
Concrete and steel structures
Electrical and mechanical applications
Environmental impacts
Evaluation
Geotechnical applications
Hyraulics applications
Maintenance
Operations management
Rehabilitation
Repair